S.Q. OUTPUT PENTODE

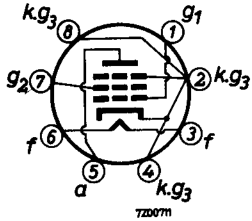
Special quality pentode designed for use as output tube and video amplifier.

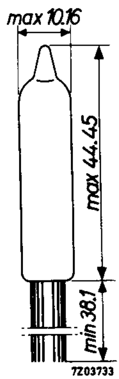
QUICK REFERENCE DATA			
Life test	1000 hours		
Mechanical quality	Shock and vibration resistant		
Base	Subminiature		
Heating	Indirect A.C. or D.C., parallel supply		
Heater voltage	V_f	6.3	V
Heater current	I_f	450	mA
Mutual conductance	S	9	mA/V
Anode current	I_a	21	mA

DIMENSIONS AND CONNECTIONS

Base: Subminiature

Dimensions in mm





Connections should not be soldered nearer than 5 mm to the seal.
Leads should not be bent nearer than 1.5 mm to the seal.

CHARACTERISTICS

Column I Nominal value or setting of the tube
II Range values for equipment design: Initial spread
III Range values for equipment design: End of life value

		I	II	III	
Heater voltage	V_f	6.3			V
Heater current	I_f	450	420-480		mA
Anode voltage	V_a	150			V
Grid No.2 voltage	V_{g_2}	100			V
Cathode resistor	R_k	100			Ω
Anode current	I_a	21	14-28		mA
Grid No.2 current	I_{g_2}	4.0	2-6		mA
Mutual conductance	S	9.0	7.5-10.5	ΔS: max. 20%	mA/V
Internal resistance	R_i	50			kΩ
Negative grid No.1 current	$-I_{g_1}$		max. 1.0	max. 2.0	μA
Grid No.1 resistor R_{g_1} = 1 MΩ					
Grid No.1 cut-off voltage	$-V_{g_1}$	14			
Anode voltage	V_a	150			V
Grid No.2 voltage	V_{g_2}	100			V
Anode current	I_a		max. 75		μA
Leakage current between cathode and heater	I_{kf}		max. 15	max. 60	μA
Voltage between cathode and heater V_{kf} = 100 V					
Insulation resistance between two electrodes	R_{ins}		min. 100	min. 50	MΩ
Voltage between electrodes V = 100 V					

CHARACTERISTICS (continued)

		I	II	III	
Vibrational noise output	V_o		max. 100		mV_{eff}
Anode supply voltage	V_{ba}	150			V
Anode resistor	R_a	2			kΩ
Grid No.2 voltage	V_{g_2}	100			V
Cathode resistor	R_k	100			Ω
Cathode by pass capacitor C_k = 1000 μF					
Grid No.1 resistor R_{g_1} = 0.1 MΩ					
Vibration frequency = 40 Hz					
Acceleration = 15 g					

CAPACITANCES With external shield, inside diameter 10.3 mm

		I	II	
Grid No.1 to grid No.2, grid No.3, cathode and heater	$C_{g_1/g_2\,k\,g_3f}$	9	8-10	pF
Anode to grid No.2, grid No.3, cathode and heater	$C_{a/g_2\,k\,g_3f}$	8	7-9	pF
Anode to grid No.1	C_{ag_1}		max.0.13	pF

SHOCK AND VIBRATION RESISTANCE

The following test conditions are applied to assess the mechanical quality of the tube. These conditions are not intended to be used as normal operating conditions.

Shock

The tube is subjected 5 times in each of 4 positions to an acceleration of 500 g supplied by an NRL shock machine with the hammer lifted over an angle of 30°.

Vibration

The tube is subjected during 32 hours in each of 3 positions to a vibration frequency of 50 Hz with an acceleration of 2.5 g.

LIFE

Production samples are tested to be within the end of life values (column III) during 1.000 hours.

LIMITING VALUES (Absolute max. rating system)

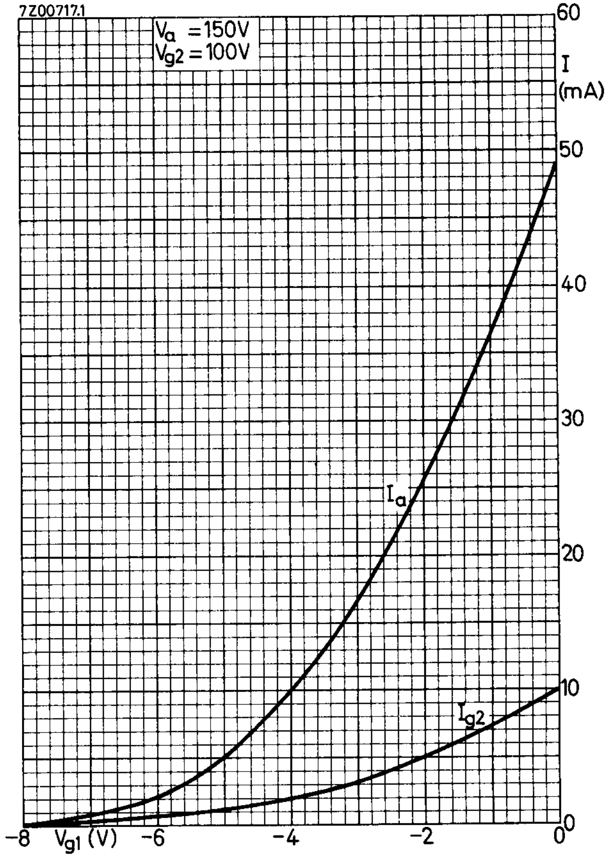
Anode voltage	V_{a_o}	max.	330	V
Anode voltage	V_a	max.	165	V
Anode dissipation	W_a	max.	4	W
Grid No.2 voltage	V_{g_2}	max.	155	V
Grid No.2 dissipation	W_{g_2}	max.	1	W
Grid No.1 voltage	V_{g_1}	max.	0	V
Grid No.1 negative voltage	$-V_{g_1}$	max.	55	V
Grid No.1 resistor				
with fixed bias	R_{g_1}	max.	100	kΩ
with automatic bias	R_{g_1}	max.	500	kΩ
Cathode current	I_k	max.	40	mA
Voltage between cathode and heater,				
d.c. component	V_{kf}	max.	200	V
peak value	V_{kf_p}	max.	200	V
Bulb temperature	t_{bulb}	max.	220	^{o}C

Heater voltage: The average heater voltage should be 6.3 V
Variations of the heater voltage exceeding the range of 6.0 to 6.6 V will shorten the tube life.

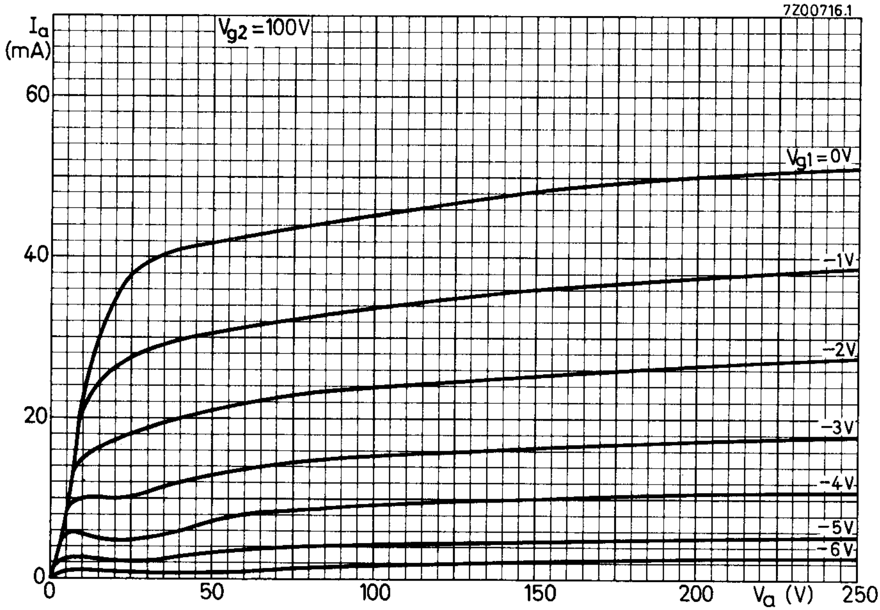
OPERATING CHARACTERISTICS

Output tube class A

Anode voltage	V_a	150	V
Grid No.2 voltage	V_{g_2}	100	V
Cathode resistor	R_k	100	Ω
Load resistance	$R_{a\sim}$	9	kΩ
Input voltage	V_i	2	V_{RMS}
Output power	W_o	1	W



7Z00717.1
V_a = 150V
V_{g2} = 100V
I (mA)
60
50
40
30
20
10
0
I_a
I_{g2}
−8
V_{g1} (V)
−6
−4
−2
0


7Z00716.1
Ia
(mA)
Vg2 = 100V
Vg1 = 0V
−1V
−2V
−3V
−4V
−5V
−6V
60
40
20
0
0
50
100
150
200
Va (V)
250

PHILIPS

Data handbook

Electronic components and materials

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